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# The effect of formal teacher education on reading achievement of 3rd-grade students in public and independent schools in Sweden

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## Previous research

- For several decades there have been contradictory results regarding the possibilities to establish relationships between observable variables of teacher competence and student achievement. For example, Coleman et al. 1966, concluded that family and peers were important for student achievement but not schools and teachers.
- One reason for the difficulties in teacher efficiency research is that at least three aspects of teacher competence often have been confounded
  - Formal competence (certification)
  - Experienced/evaluated competence (by students, parents or principals)
  - Achievement-related competence (as measured by students' test results, grades)





## Previous research cont.

- The most fundamental meaning of teacher competence refers to the kind of competence that can be related to students' results – achievement-related competence. High quality teachers are ones who consistently obtain higher than expected gains in student performance (Hanushek, 2003) “The simple definition of teacher quality”
- This aspect has to have some degree of stability to be of interest. However, it does not mean that effects have to be constant over subjects and grades, but that the teacher is successful in the subjects and age-groups they teach
- A growing body of evidence now indicates that teacher competence has a strong effect on student achievement. Recent research suggests that at least 10 % of the variance between classrooms can be explained by variation among teachers. (Nye et al. 2004; Hattie, 2009)
- Adequate teacher education stands out as an important determinant of teacher efficiency. The combination of content knowledge and pedagogical content knowledge seems to be of great importance





## The Swedish school system

- Since the late eighties, the Swedish school system has been decentralised and deregulated
- A voucher system was adopted in Sweden in 1992. It was supposed to increase pedagogical variation, inspire and develop educational practice
- Formal teacher education was among advocates for private/independent schools not considered to be of particular significance for students' achievement
- Instead one emphasized the presumed greater enthusiasm of teachers and school leaders in independent schools, the stress on academic excellence, the more fruitful co-operation with parents, the better school climate and the unbound pedagogy





## Two main questions:

- Does teacher certification for teaching in early grades influence the mean reading test performance of third graders in Sweden?
- Is the effect of teacher certification on students' achievement the same in independent and public schools?





## Data

- As a national option, Sweden participated with three samples in PIRLS 2001. One with 4th graders, one with 3rd graders and one sample with 3rd graders for the repeat of the 1991 Reading literacy study
- As another national option, independent schools were over-sampled to allow analyses between public and independent schools (less than 4 % independent schools at the time for testing)
- This study uses the two 3rd grade samples. The PIRLS 2001 reading test and the RL1991 reading test have been transformed into the same scale, a total achievement score, by equating the percentile scores of the two scales
- Teacher Questionnaire, type of education
- Parent Questionnaire, 9 educational levels
- Little missing data
- About 75 % of the students had been taught by the same teacher since the beginning of first grade





## Sample

	Public	Independent	Total
Schools	238	54	292
Classes	641	76	717
Teachers	956	111	1 067
Students	9 598	1 034	10 632





## Variables

- **Dependent**
  - Totach (mean total reading achievement score)
- **Independent**
  - School type (public/independent)
  - Teacher sex
  - Teacher age
  - Teacher experience
  - Teacher in-service training
  - Teacher cooperation
  - Teacher education (certification for teaching in lower primary school/not certified or certified for teaching in higher grades)
  - *Parental education* (mothers' and fathers' highest education)





## Effects of indicators of teacher competence on reading achievement

- Independent variables (inserted one at a time)
  - Gender (t = 2.38\*)
  - Age (t = 1.42)
  - Experience (t = 1.53)
  - In-service training (t = 0.44)
  - Cooperation (t = 1.68)





Effects of schooltype, adequate teacher certification and parents' education on students' reading achievement (School type x Certified – no significant interaction ( $t = 0.51$ ), the effect of adequate education is thus the same in both schooltypes)

Model 1		"Schooltype"	"Tcert"	
	estimated value	24.3	25.6	
	t-value	3.34	4.40	
Model 2		"Schooltype"	"Tcert"	<i>Pareduc</i>
	estimated value	2.44	22.6	26.86
	t-value	0.38	4.39	17.86





## Main results

- Adequate teacher certification explained a substantial part of Swedish 3rd grade students' reading achievement, that is, formal competence and achievement related competence overlapped
- The effect of formal and adequate teacher education was the same in public and independent schools,
- Teacher education and parents' education were about equally important factors in both school types, schooltype mediated effects of parents' and teachers' education
- No significant effects of several other aspects of teacher competence could be established





## Discussion and Conclusions

- The strong relation between adequate teacher education and achievement makes recruitment problems a critical issue
- The demand and supply-model assumes that the simple solution to recruitment problems is an increased differentiation of wages
- However, many other factors affect students' choices. Above all, the status of the profession and working conditions influence decisions about entering teacher education
- Therefore, teacher recruitment should be conceptualised as dependent on the interaction between various aspects of teacher education (e.g., entrance requirements and length), the status of the teacher profession and the situation on the labour market at a given time
- Too generous entrance requirements can have negative effects on the status and the quality of teachers
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